Refeeding syndrome

Refeeding syndrome (RFS) is the name of a set of **metabolic abnormalities** arising as a result of the resumption of food intake, especially when a larger amount of glucose is administered in malnourished or starving patients. Blood tests usually reveal a sharp drop in the serum level of phosphates, magnesium and potassium, which manifests itself in clinical symptoms such as mental changes and paresthesia, and can even result in a life-threatening condition threatening the patient with malignant arrhythmia and heart failure.

Symptomps

- changes in mental state (up to delirious states)
- paresthesia and muscle paralysis
- fluid retention
- malignant arrhythmia
- cardiorespiratory insufficiency to heart failure

History

The first reports of sudden deaths of patients in whom realimentation was initiated appeared after the Second World War, when soldiers with a **high degree of malnutrition** were returning from captivity of war. However, the causes of this phenomenon were clarified only in the 1970s, when it was possible to monitor the **internal environment and the ion balance**. At that time, the unequivocal etiology of RFS was also established, which is hypophosphatemia, hypomagnesemia, and hypokalemia.

Clinical signs

A **sharp drop in the serum level of phosphates, magnesium and potassium**, despite the fact that the plasma level of ions before refeeding is close to normal or completely normal. Reduced values could be found intracellularly. Other manifestations include **water and sodium retention.**

Groups at risk

Among the risk groups in which the risk of RFS should be taken into account are oncological patients, alcohol-dependent patients for whom alcohol replaces a full diet, patients with malabsorption syndrome and patients suffering from anorexia nervosa, in whom the initiation of refeeding is often associated with reluctance accept the administered nutrition. Intentional, often unrecognized reduction of food doses can paradoxically save patients from developing RFS. Another risk group is patients with long-term disturbed food intake (geriatric patients), seniors with severe depressive syndrome, drug addicts and poorly controlled patients with diabetes. It should be noted that RFS rarely occurs in a patient who is being fed orally. The reason is that it is rarely possible to achieve a five-day intake of food that contains 300-400 g of carbohydrates per 24 hours.[1]

Treatment and prevention

The prevention of the development of severe symptoms of RFS is **permanent monitoring of the internal environment** in at-risk patients. In the second phase, early detection of disruption of the ionic balance and its restoration is absolutely essential. Monitoring daily urinary sodium, potassium, and phosphate excretion may also be beneficial. (In patients with anorexia, sodium monitoring may help detect occult vomiting and regurgitation.)[2]

Patophysiology

Long-term starvation entails metabolic changes. Apart from erythrocytes, the brain, the skin and the lens of the eye, for which **glucose** serves as an energy substrate, the tissues switch to fatty acid metabolism after the exhaustion of sugar reserves. Gradually, all muscle and liver glycogen is broken down, and blood glucose is maintained by **gluconeogenesis from glucoplastic amino acids and glycerol.** When the level of cellular metabolism decreases, a state of depletion of energy reserves occurs from phosphate bonds necessary for basic cellular functions, such as the transmembrane transfer of sodium and potassium (by means of Na+/K+ ATPase). Replenishment of glucose leads to the restoration of metabolism, which requires the supply of phosphates. The start of anabolic processes leads to the transfer of phosphates and glucose (due to insulin) into the cell. Together with phosphorus and glucose, potassium and magnesium also move into the cell, which leads to a decrease in their plasma level and thus the development of symptoms.[1]

Links

References

1. PLÁŠEK, Jiří, Vladimír HRABOVSKÝ a Arnošt MARTÍNEK. Refeeding syndrom - skrytá klinická hrozba. *Interní medicína pro praxi* [online]. 2010, vol. 12, no. 9, s. 439-441, dostupné také z <http://www.internimedicina.cz/pdfs/int/2010/09/11.pdf>. ISSN 1803-5256.
2. NAVRÁTILOVÁ, Miroslava. Riziko refeeding syndromu u mentální anorexie. *Psychiatrie pro praxi* [online]. 2002, vol. 2, no. 4, s. 146-151, dostupné také z <http://www.solen.cz/savepdfs/psy/2002/04/02.pdf>. ISSN 1803-5272.